CLAIMS

1. A heat pipe comprising:

an upper member having a concave portion on a lower surface;

a lower member having a concave portion on an upper surface;

one or more intermediate plate members provided between said upper member and said lower member, said intermediate plate member including a plurality of slits, constructing a vapor path extending in a planar direction, communicating with the concave portions of said upper and lower members to form a sealed space defined by said slits and concave portions,

a refrigerant enclosed in said sealed space, and

capillary holes formed through a non-slitted portion of said intermediate plate member, said capillary hole serving as a capillary path of flow extending vertically or both vertically and horizontally, communicating with the concave portions of said upper and lower members.

2. The heat pipe according to claim 1, wherein said intermediate plate members are more than one, each intermediate plate member having the capillary hole defined as a though-hole having a certain planar area, such that the though-holes of said intermediate plate members are overlapped only partially to define said capillary path of flow having a planar area narrower than that of each through-hole.

3. The heat pipe according to claim 1, further comprising an device mounting section provided on an outer surface of at least one of said upper and lower members, said device being to be cooled by the heat pipe, wherein said device mounting section is formed integrally with a plurality of projections.

4. The heat pipe according to claim 2, further comprising an device mounting section provided on an outer surface of at least one of said upper and lower members, said device being to be cooled by the heat pipe, wherein said device mounting section is formed integrally with a plurality of projections.

5. The heat pipe according to one of claims 1 to 4, wherein said heat pipe has a

rectangular planar shape, wherein said device mounting section is arranged in the center of said heat pipe, while each of said slits extends in an oblique direction relative to sides of said heat pipe.

6. The heat pipe according to one of claims 1 to 4, wherein said heat pipe has a rectangular planar shape, wherein said device mounting section is arranged in the center of said heat pipe, while each of said slits extends in a radial direction from said device mounting section.

7. The heat pipe according to claim 3 or 4, wherein said upper member, intermediate plate members and lower member are joined to each other by hot pressure-welding of projections partially formed in a peripheral portion of said heat pipe and from a peripheral portion of said device mounting section to a neighborhood thereof.

8. The heat pipe according to claim 5, wherein said upper member, intermediate plate member and lower member are joined to each other by hot pressure-welding of projections partially formed in a peripheral portion of said heat pipe and from a peripheral portion of said device mounting section to a neighborhood thereof.

9. The heat pipe according to claim 6, wherein said upper member, intermediate plate members and lower member are joined to each other by hot pressure-welding of projections partially formed in a peripheral portion of said heat pipe and from a peripheral portion of said device mounting section to a neighborhood thereof.

10. A method for manufacturing a heat pipe, said method at least comprises the steps of:

preparing a lower member having a concave portion on an upper surface, an upper member having a concave portion on a lower surface, and one or more intermediate plate members including a plurality of slits, constructing a vapor path extending in a planar direction, communicating with the concave portions of said upper and lower members when said members are joined together;

forming projections on at least one of opposite surfaces of said members to be joined so that said projections are formed in a peripheral portion of said heat pipe and

from a peripheral portion of said device mounting section to a neighborhood thereof; and

joining said upper member, one or more intermediate plate members and lower member together by hot pressure-welding of said members in positions where said projections are formed.

11. A heat pipe comprising:

an upper member having a concave portion on a lower surface;

a lower member having a concave portion on an upper surface;

one or more intermediate plate members provided between said upper member and said lower member, said intermediate plate member including a plurality of slits, constructing a vapor path extending in a planar direction, communicating with the concave portions of said upper and lower members, said members being stacked to form a sealed space defined by said slits and concave portions;

one or more refrigerant charging holes formed through one of said upper and lower members, said charging holes communicating with said sealed space;

a refrigerant enclosed in said sealed space, and

a sealing plug for sealing each of said refrigerant charging holes, said sealing plug being made from ductile metal.

12. The heat pipe according to claim 11, further comprising one or more degassing grooves formed on a peripheral inner surface of each of said refrigerant charging holes, wherein said degassing groove keeps an interior space communicated with an exterior space until each refrigerant charging hole is sealed fully by said sealing plug, while said degassing groove allows the refrigerant charging hole is sealed when each refrigerant charging hole is sealed fully by said sealing plug.

13. The heat pipe according to claim 11 or 12, wherein each refrigerant charging hole has a larger diameter in an upper portion thereof than in a lower portion thereof, while a surface of said sealing plug for sealing each refrigerant charging hole is not protruded from an outer surface of the member formed with said refrigerant charging hole.

14. A method for manufacturing a heat pipe, said method at least comprises the steps of:

preparing a lower member having a concave portion on an upper surface, an upper member having a concave portion on a lower surface, and one or more intermediate plate members including a plurality of slits, constructing a vapor path extending in a planar direction, communicating with the concave portions of said upper and lower members when said members are joined together;

forming projections on at least one of opposite surfaces of said members to be joined; and

joining said upper member, one or more intermediate plate members and lower member together by hot pressure-welding of said members in positions where said projections are formed;

supplying a refrigerant into said sealed space through said refrigerant charging hole under reduced pressure; and

placing a ductile metallic body serving as said sealing plug in each refrigerant charging hole, and then pressure-welding said ductile metallic body to thereby provide said sealing plug for sealing each refrigerant charging hole.